

Application No.: 10/019,459

Docket No.: BA1-99-137A (99-137A)

**REMARKS**

Claims 1, 5-7, and 9-12 were pending when a non-final Office Action was mailed on November 3, 2004. Claims 1, 5-7, and 11-12 were rejected under 35 U.S.C. § 103. Claims 9 and 10 were objected to as being dependent upon a rejected base claim, but were indicated as being allowable. The Examiner is thanked for indication of allowable subject matter.

In light of arguments set forth herein, Applicants very respectfully submit that all claims pending in this patent application are in condition for allowance. Applicants very respectfully request entry of the Amendment, and reconsideration and allowance of all claims pending in this patent application.

I. REJECTION UNDER 35 U.S.C. § 103

The Office Action stated that Claims 1, 5-7, and 11-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,936,552 to Wichgers et al. in view of U.S. Patent No. 5,781,146 to Frederick. The Examiner confirmed in a telephone message to Applicants' attorney on April 11, 2005, that Claims 1, 5-7, and 11-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wichgers et al. in view of Frederick and further in view of U.S. Patent No. 6,088,654 to Lepere et al.

The Office Action stated that Wichgers et al. discloses a flight display for aircraft for displaying pictorial representation of aircraft 36 in plan view and/or aircraft 48 in profile view, including terrain elevations, except for specifically having width and lengths of specific size and an altitude reference scale, where the width of representation widens as distance from aircraft increases. The Office Action also stated that choosing to have displays represent specific range values would have been obvious in order to only obtain terrain data relative to a flight path of interest.

The Office Action further stated that Frederick teaches desirability of displaying an altitude scale adjacent a view of aircraft location with respect to terrain elevation (*citing* Fig. 3).

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The Office Action also stated that Lepere teaches desirability in a terrain warning system of using a representation of future flight path which widens as distance from aircraft increases, and which rotates in a direction of a turn (*citing* column 11, lines 36-56; *also citing* Figs. 4 and 11).

The Office Action set forth the position that it would have been obvious to display altitude scale adjacent a display showing aircraft position with respect to terrain height in order to allow a pilot to know more specifically how high terrain was in case it was necessary to navigate around it. The Office Action further set forth the position that it would have been obvious to use an aircraft path representation that widened with distance from an aircraft, and curved in the direction of a turn, in order that advance warnings could have been given if a pilot had to suddenly turn from a set course, and so that nuisance alerts could have been avoided where a pilot initiated a turn that would clearly avoid terrain from a previous path. Applicants respectfully traverse.

A. THE CITED REFERENCES

Each of the cited references will be discussed below.

1. WICHGERS ET AL.

Wichgers et al. discloses an integrated horizontal and profile terrain display format for situational awareness. A terrain situational awareness system employs a display format that is stated to enhance a crew's situational awareness of terrain hazards and man-made obstacles. The terrain awareness system employs positional data and a terrain database to provide visual information and warning. The display integrates both horizontal and profile perspectives of potential hazards. According to Wichgers et al., a crew will instantaneously know whether their path, within the vehicle's operational envelope is safe. *See* Wichgers et al., column 2, line 66 -- column 3, line 27.

Wichgers et al. discloses that "[t]errain profile 52 depicts the vertical terrain elevation profile of the path *directly in front of the aircraft*. The terrain profile 52 of lower portion 34 is

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taken *along the vertical dashed line 40* of upper portion 32.” *Id.*, column 6, lines 52-55 (emphasis supplied); *See Id.*, Figure 3.

2. FREDERICK

Frederick discloses a weather radar and terrain display map display system for aircraft. Terrain elevation and weather information are displayed simultaneously. According to Frederick, “[a] *constant band of voxels 521 ahead of the aircraft 523 will maintain a constant relationship with the aircraft* and will move with the aircraft relative to terrain. The pilot can select the transverse length 525 of the band...and the distance between the *constant band* and the aircraft 529.” Frederick, column 10, lines 37 – 41 (emphasis supplied); *See Id.*, Figure 5a.

Frederick teaches a vertical *front view* image 104 with altitude indicia (Fig. 2) and a vertical *front view* image 204 with unlabeled altitude indicia (Fig. 3). *See Id.*, column 6, 45-67.

3. LEPERE ET AL.

Lepere et al. discloses a terrain anti-collision process and device for aircraft with improved display.

The display of Lepere et al. is only shown in, and discussed in reference to, Figs. 8A-8D. Referring to Figs. 8A-8D, all of the displays disclosed by Lepere et al. are plan views; none of the displays disclosed by Lepere et al. are side or profile views. In the plan views of Lepere et al., an intersection contour CI represents the significant reliefs which are liable to present a danger to the airplane given its position and current trajectory. Lepere et al., column 12, lines 62-64. Visual information CPA is a pre-alarm contour and visual information CA is an alarm contour on the geographical zones in which alarms relating to the terrain (“pre-alarms” and “alarms”) may potentially be generated. *Id.*, column 12, line 66 – column 13, line 2. Information INF relates to the location of towns or airport zones.

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Lepere et al. explains generation of the visual representation from column 14, line 40 – column 16, line 15. Image background represents the height of the reliefs relative to the estimated altitude which the airplane will have at each of the relevant points given its position and its current trajectory. This estimation can be performed according to radials from its current position according to the current slope of its trajectory or according to curves representative of the turn to be performed in order to reach each of these points. *Id.*, column 14, lines 43-50.

Such a presentation makes it possible to show the potential risks of collision with the relief of the terrain, and to do so having regard to the current trajectory TF of the airplane. Thus, only the actual risks are displayed and appear for a given slope (whether this be a descent or a climb) via the opposite end of the display from the aircraft, allowing anticipation of these risks. *This display is preferably performed by "projecting" the contour onto a horizontal plane. Id.*, column 14, lines 52-60 (emphasis supplied).

This relative height is represented by symbols of different color and/or variable density and/or with different symbols (for example in the form of + and/or ^ and/or ~ and/or a triangle) depending on the slices of this relative height. *Id.*, column 14, lines 61-64. Lepere et al teaches that it is advisable to give these contours and/or the zones they delimit a distinctive representation. This distinctive character can be obtained, with the aid of a marking module 402 (Fig. 2), by markings such as dashes (as in Figs. 8A to 8D) or symbols of different colors or different shades (for example shades of grey) and/or of variable density and/or with different symbols for the pre-alarm zone and the alarm zone. A yellow or amber tint is regarded as preferable to differentiate the pre-alarm zone and a red tint is regarded as preferable to differentiate the alarm zone. *Id.*, column 15, lines 58-67.

B. A PRIMA FACIE CASE OF OBVIOUSNESS HAS NOT BEEN ESTABLISHED

Applicants very respectfully submit that a *prima facie* case of obviousness has not been established because the combination of the cited references does not teach or suggest the claimed invention and because there is no motivation to combine the cited references.

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1. THE COMBINATION OF REFERENCES DOES NOT TEACH OR SUGGEST THE CLAIMED INVENTION

Applicants very respectfully submit that a *prima facie* case of obviousness has not been established because the combination of the cited references does not teach or suggest the claimed invention.

As discussed above, Wichgers et al. depicts the vertical terrain elevation profile of the path directly in front of the aircraft taken along the vertical dashed line 40 of upper portion 32 (Figure 5a). This depiction is precisely the type of prior art flight deck display discussed in the "Background of the Invention" section of Applicants' patent application:

For flight deck displays that show the terrain directly in front of the aircraft, the input for this type of device may be a database of topography information that generates a display based on information from the aircraft's navigational equipment. However, the display changes with slight adjustments to the direction of the aircraft, making it appear 'noisy'. Also, navigational instruments for determining the exact position of an aircraft usually have some degree of error. For example, if the aircraft's automated navigational equipment is only accurate to within 10 nautical miles of the exact location of the aircraft, and the topography display only shows a 'line' of topography directly in front of where the aircraft instruments indicate the aircraft is located, the topography display will not be accurate as to the topography directly in front of the aircraft if the aircraft's exact position is actually 9.5 nautical miles from the location indicated by the navigation equipment. U.S. Patent Application 10/019,459, p. 2, lines 11-24.

Applicants respectfully submit that the display of the height of the terrain taken along a line directly in front of an aircraft of Wichgers et al. does not teach or suggest "a pictorial representation to scale of a profile of highest elevations of a swath of terrain along the path area, a width of the swath widening as distance from the aircraft increases" as recited in Claim 1.

Applicants also respectfully submit that neither the vertical front views nor the constant band of voxels 521 ahead of the aircraft 523 of Frederick teaches or suggests "a pictorial

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representation to scale of a profile of highest elevations of a swath of terrain along the path area, a width of the swath widening as distance from the aircraft increases” as recited in Claim 1. Therefore, Frederick does not overcome the above-identified deficiency of Wichgers et al.

Applicants also respectfully submit that displaying all of the heights within different alarm contours by projecting the contour onto a horizontal plan view as taught by Lepere et al. cannot and does not teach or suggest “a pictorial representation to scale of a profile of highest elevations of a swath of terrain along the path area, a width of the swath widening as distance from the aircraft increases” as recited in Claim 1. Therefore, Lepere et al. does not overcome the above-identified deficiency of Wichgers et al.

Applicants therefore respectfully submit that the combination of Wichgers et al., Frederick, and Lepere et al. does not teach or suggest “a pictorial representation to scale of a profile of highest elevations of a swath of terrain along the path area, a width of the swath widening as distance from the aircraft increases” as recited in Claim 1. Because the combination of Wichgers et al., Frederick, and Lepere et al. does not teach or suggest the claimed invention, Applicants respectfully submit that a *prima facie* case of obviousness has not been established. Accordingly, Applicants respectfully submit that claim 1, as amended, is not obvious and is patentable over the combination of Wichgers et al., Frederick, and Lepere et al.

Claims 5-7, 11, and 12 depend from Claim 1. By virtue of their dependency and for other reasons, Applicants respectfully submit that Claims 5-7, 11, and 12 are not obvious and are patentable over the combination of Wichgers et al., Frederick, and Lepere et al.

Accordingly, Applicants respectfully request entry of the Amendment, and reconsideration and allowance of Claims 1, 5-7, 11, and 12.

2. THERE IS NO MOTIVATION TO COMBINE THE CITED REFERENCES

Applicants very respectfully submit that a *prima facie* case of obviousness has not been established because there is no motivation in the prior art to combine the cited references.

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For the reasons discussed above, Applicants respectfully reiterate that the combination of cited references does not teach or suggest the claimed invention. Further, the constant voxel band of Frederick teaches away from "a width of the swath widening as distance from the aircraft increases" as recited in Claim 1. Moreover, Applicants respectfully submit that there is no motivation to combine the plan view of Lepere et al. (that makes no reference at all to a profile view) with the profile view of Wichgers et al.

Therefore, Applicants respectfully submit that there is no motivation to combine the cited references. Applicants very respectfully submit that the only motivation can be found using the Applicants' own specification as a blueprint to arrive at the claimed invention – which Applicants very respectfully reiterate is neither taught nor suggested by the combination of cited references. As such, Applicants very respectfully submit that only impermissible hindsight can be used to arrive at the claimed invention.

Thus, Applicants very respectfully submit that a *prima facie* case of obviousness has not been established because there is no motivation in the prior art to combine the cited references.

## II. OBJECTION TO CLAIMS 9-10

The Office Action objected to Claims 9-10 as being dependent upon a rejected base claim, but indicated that Claims 9-10 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Examiner is thanked for indication of allowable subject matter.

Claims 9-10 depend from Claim 1. For the reasons discussed above, Applicants respectfully submit that Claim 1, as amended, is allowable over the cited references. Because of their dependency from Claim 1 that is submitted to be allowable, Applicants respectfully submit that the objection to Claims 9-10 has been overcome. Applicants very respectfully request entry of the Amendment, and reconsideration and allowance of Claims 9-10.

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III. Amendment to Claim 9


Claim 9 has been amended to correct a minor typographical error. Claim 9 has not been amended to narrow the claim or for any reason related to patentability.

CONCLUSION

Applicants respectfully submit that Claims 1, 5-7, 11 and 12 are not obvious and are patentable over the combination of Wichgers et al., Frederick, and Lepere et al. Applicants very respectfully submit that all claims pending in this patent application are in condition for allowance. Applicants very respectfully request entry of the Amendment, and reconsideration and allowance of Claims 1, 5-7, and 9-12 pending in this patent application.

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Respectfully submitted,

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